

Claim(s)

What is claimed is:

1. For use in a semiconductor test system comprising a probe card and a supplemental current source, a method for reducing variation in a voltage supplied to a power input terminal of a semiconductor device under test, said method comprising:

providing power through said probe card to said power input terminal of said semiconductor device under test;

providing an input signal to said supplemental current source, said input signal corresponding to a temporary change in current drawn by said input terminal of said semiconductor device; and

providing supplemental current to said input terminal from said supplemental current source in response to said input signal.

2. The method of claim 1 further comprising changing a state of said semiconductor device, which causes said temporary change in current drawn by said input terminal of said semiconductor device.

3. The method of claim 1 further comprising sensing changes in current drawn by said input terminal of said semiconductor device.

4. The method of claim 3, wherein said sensing changes in current drawn by said input terminal comprises sensing a change in current through a bypass capacitor in electrical communication with said power input terminal.

5. The method of claim 3 wherein said sensing changes in current drawn by said input terminal comprises sensing a change in current through a conductive path on said probe card that is in electrical communication with said power input terminal.

6. The method of claim 1, wherein a quantity of said supplemental current corresponds to a quantity of current drawn by said input terminal.

7. The method of claim 1, wherein said supplemental current source comprises an amplifier.

8. The method of claim 1, wherein said supplemental current is provided to said input terminal through a capacitor.

9. The method of claim 1, wherein said supplemental current source is disposed on said probe card.

10. The method of claim 1, wherein said probe card comprises a plurality of interconnected substrates.

11. The method of claim 10, wherein said plurality of interconnected substrates comprises a probe head.

12. The method of claim 11, wherein said supplemental current source is disposed on said probe head.

13. The method of claim 1 further comprising providing at least one advanced signal to a reference device.

14. The method of claim 13, wherein said input signal to said supplemental current source corresponds to an amount of current drawn by said reference device in response to said at least one advanced signal.

15. The method of claim 1, wherein:

said providing power further comprises providing power through said probe card to a power input terminal of each of a plurality of said semiconductor devices under test;

said providing an input signal to said supplemental current source further comprises providing an input signal to each of a plurality of supplemental current sources, each said input signal corresponding to current drawn by an input terminal of one of said semiconductor devices; and

said providing supplemental current further comprises providing supplemental current to said input terminals from each of said supplemental current sources in response to said input signals.

16. An apparatus for testing a semiconductor device comprising a power input terminal and signal terminals, said apparatus comprising:

a probe card comprising conductive connection structures for contacting said power input terminal and said signal terminals; and

a supplemental current source having an output electrically connected to said connection structure for contacting said power input terminal, an input of said supplemental current source electrically connected to a signal corresponding to a change in current drawn by said power input terminal caused by a change in a signal on one of said signal terminals, wherein said supplemental current source provides supplemental current to said power input terminal in response to a change in current drawn by said power input terminal.

17. The apparatus of claim 16 further comprising a current sensing device disposed to sense a change in current drawn by said power input terminal, said current sensing device providing a corresponding signal to said input of said supplemental current source.

18. The apparatus of claim 17, wherein said current sensing device comprises a current sense coupler.

19. The apparatus of claim 17, wherein said current sensing device comprises a current transformer.

20. The apparatus of claim 17, wherein said current sensing device is disposed to sense a change in current through a bypass capacitor in electrical communication with said power input terminal.

21. The apparatus of claim 17, wherein said current sensing device is disposed to sense an change in current through a conductive path on said probe card that is in electrical communication with said power input terminal.

<sup>18</sup> 22. The apparatus of claim <sup>13</sup> 16, wherein said supplemental current source comprises an amplifier.

<sup>19</sup> 23. The apparatus of claim <sup>13</sup> 16, wherein said output of said supplemental current source is electrically connected to said power input terminal through a capacitor.

<sup>20</sup> 24. The apparatus of claim <sup>13</sup> 16, wherein said supplemental current source is disposed on said probe card.

<sup>21</sup> 25. The apparatus of claim <sup>20</sup> 24, wherein said probe card comprises a plurality of interconnected substrates.

<sup>22</sup> 26. The apparatus of claim <sup>21</sup> 25, wherein said plurality of interconnected substrates comprises a probe head.

<sup>23</sup> 27. The apparatus of claim <sup>22</sup> 26, wherein said supplemental current source is disposed on said probe head.

28. The apparatus of claim 16 further comprising a reference device, a power input terminal of said reference device electrically connected to said input of said supplemental current device.

29. The apparatus of claim 28 further comprising a tester in electrical connection with said probe card, said tester configured to change a signal provided to said reference device and thereafter change a similar signal provided to said semiconductor device.

<sup>24</sup><sub>30</sub>. The apparatus of claim <sup>13</sup><sub>16</sub>, wherein said apparatus tests a plurality of semiconductor devices.

<sup>25</sup><sub>31</sub>. The apparatus of claim <sup>24</sup><sub>30</sub>, wherein said probe card provides power to input terminals of each of said plurality of semiconductor devices.

32. An apparatus for testing a semiconductor device comprising a power input terminal and signal terminals, said apparatus comprising:  
probe means for providing power to said input terminal and signals to at least one of said signal terminals; and  
supplemental current means for providing supplemental current to said power input terminal in response to a change in current drawn by said power input terminal caused by a change in a signal on one of said signal terminals, said supplemental current means having an input and an output, said input electrically connected to a signal that corresponds to said change in current drawn by said power input terminal, said output electrically connected to said power input terminal.

33. The apparatus of claim 32 further comprising current sensing means for sensing a change in current drawn by said power input terminal, said current sensing means providing a corresponding signal to said input of said supplemental current means.

<sup>27</sup><sub>34</sub>. The apparatus of claim <sup>26</sup><sub>32</sub>, wherein said supplemental current means comprises an amplifier.

35. The apparatus of claim 32, wherein said output of said supplemental current means is electrically connected to said power input terminal through a capacitor.

